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## **ELECTRICAL HAND TOOL MACHINE WITH SOFT-START**

## **BACKGROUND OF THE INVENTION**

The invention relates to an electrical hand tool machine having a current regulator disposed in the current circuit of an electrical motor having a wired soft-start input.

A damped soft-start controlled over approximately 0.5 to 2 seconds up to the desired motor r.p.m. is common in electrical hand tool machines for preventing sudden torque. Some integrated current regulators have a soft-start input for this purpose, which is controlled by the load current of an externally wired capacitor that acts in a timing manner. In electrical hand tool machines with a motor switch configured as a button, gripping by the guiding hand results in unintentional disconnection of the drive and consequently, despite a controlled running tool, resumes soft-start, wherein the desired r.p.m. is unavailable.

According to DE 19609986, a wiring arrangement for controlling an electrical motor of a hand tool machine has a current regulator arranged in the current circuit with an input for soft-start and is connected directly to a timing capacitor and to a diode as an additional discharge branch for the capacitor, wherein repeated, pulse-like controlled run is achieved.

## **SUMMARY OF THE INVENTION**

The object of the invention is to provide an electrical hand tool machine having a soft-start, which is deactivated in the event of a disconnection of short duration.

This object is achieved in accordance with the invention by an electrical hand tool machine having a motor switch, in the form of a button, and a current regulator arranged in the

current circuit of an electrical motor with soft-start input, in whose branch current a timing capacitor is arranged, wherein a current-direction dependent module is arranged between the soft-start input and the capacitor.

By virtue of the current direction-dependent module arranged in series with the timing capacitor and in the event of brief interruptions, wherein the potential of the soft-start input diminishes to low ohmage, the soft-start input is disconnected from the timing capacitor, which consequently maintains its charge essentially until the restoration of current of the current regulator and thus does not cause a recurrence of soft-start.

Advantageously, the current-direction-dependent element is configured as a diode, which is available as a standard component.

Advantageously, a timing resistor is arranged parallel to the current-direction-dependent element, in which, in conjunction with the timing capacitor, a discharge time constant is defined, whereby a minimal time is defined, after which a new soft-start occurs.

Advantageously, the discharge time constant is in the range of time of from 0.1 to 1.0 second, whereby an interruption without soft-start is coordinated with movement of the tool.

### **BRIEF DESCRIPTION OF THE INVENTION**

The exemplary embodiment of the invention will be more completely explained below with reference to the drawings, wherein Fig. 1 shows an electrical hand tool machine with soft-start, in accordance with the invention.

**DETAILED DESCRIPTION OF THE INVENTION**

According to the Fig. 1, an electrical hand tool machine 1 has a motor switch 2 configured as a button and a current regulator 4 having a soft-start input 5, in whose branch current a timing capacitor 6 is disposed, arranged in the current circuit of the electrical motor 3. An element is arranged between the soft-start input 5 and the capacitor 6 in the form of a diode, whose anode is connected to the soft-start input 5 and whose cathode is connected to the capacitor 6. A timing resistor 8 is arranged parallel to the current-direction-dependent element 7. The discharge time constant  $T_E$  formed by the product of the capacitance  $C$  of the timing capacitor 6 and the resistance value  $R$  of the resistor 8 is in the range of time of from 0.1 to 1.0 second.